Claims:

1. Apparatus for electrostatically charging powder material and supplying it to an applicator for electrostatically applying the powder material to solid dosage forms, the apparatus comprising:

a mixer for mixing a sump of the powder material to electrostatically charge the powder material, the mixer comprising two substantially parallel elongate mixing shafts having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions; and

a feeder for removing the electrostatically charged powder material from the sump and supplying it to the applicator.

2. Apparatus according to claim 1 wherein the feeder comprises a rotatable paddle wheel.

3. Apparatus according to claim 2 wherein the paddle wheel is magnetic.

4. Apparatus according to any one of the preceding claims further comprising a replenisher for replenishing the powder material in the sump.

5. Apparatus according to claim 4 wherein the replenisher is connected to a sensor for monitoring the amount of powder material in the sump.

6. Apparatus according to any one of the preceding claims wherein the mixer further comprises a third elongate mixing shaft substantially parallel to the first and second elongate mixing shafts, the third mixing shaft being positioned between the first and second mixing shafts, having mixing

paddles thereon and being arranged to rotate in either direction, the paddles on the three mixing shafts being arranged to mesh as the mixing shafts rotate.

7. Apparatus according to any one of the preceding claims wherein at least one of the mixing shafts includes slots for increasing the rate of charging of the powder material.

8. Apparatus according to any one of the preceding claims further comprising a sump of powder material.

9. Apparatus according to claim 8 wherein the sump of powder material further comprises a magnetized carrier material mixed with the powder material.

10. Apparatus as claimed in any preceding claim, the apparatus further comprising an applicator for electrostatically applying powder material to solid dosage forms, the applicator comprising:

a sleeve for receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material from a sump, the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve and the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto solid dosage forms passing alongside the sleeve.

11. Apparatus according to claim 10, wherein the application further comprising at least one magnet inside the sleeve for applying the rotating magnetic field to the sleeve.

12. Apparatus according to claim 10 or claim 11, wherein the applicator further comprises a second sleeve for receiving a

mixture of electrostatically charged powder material combined with a magnetized carrier material from the sump, the second sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the second sleeve and the second sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto the solid dosage forms passing alongside the second sleeve.

13. Apparatus according to claim 12, wherein the applicator further comprises at least one magnet inside the second sleeve for applying the rotating magnetic field to the second sleeve.

14. Apparatus according to claim 12 or claim 13 wherein the first sleeve and the second sleeve are arranged to have oppositely rotating magnetic fields applied thereto.

15. Apparatus according to any one of claims 10 to 14, wherein the applicator further comprises a blade alongside the sleeve or sleeves for controlling the height of the mixture on the sleeve or sleeves.

16. Apparatus according to any one of claims 10 to 15, wherein the sleeve or sleeves are substantially cylindrical.

17. Apparatus according to any one of claims 10 to 15, wherein the sleeve or sleeves are substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve located on the sleeve where the solid dosage forms are arranged to pass alongside the sleeve or sleeves.

18. Apparatus according to any one of claims 10 to 17, wherein the sleeve or sleeves include a magnetic shield arranged to provide a localised reduction in the magnetic field strength at the surface of the sleeve at an offload position of said sleeve.

19. Apparatus according to claim 18, wherein said shield is a mu-metal shield.

20. Apparatus according to any one of claims 10 to 19 wherein the sleeve or sleeves are made from stainless steel.

21. A method for electrostatically charging powder material and supplying it to an applicator for electrostatically applying the powder material to solid dosage forms, the method comprising the steps of:

mixing a sump of the powder material to electrostatically charge the powder material, the step of mixing comprising rotating two substantially parallel elongate mixing shafts in opposite directions, the mixing shafts having oppositely angled mixing paddles;

removing the electrostatically charged powder from the sump; and

supplying the electrostatically charged powder material to the applicator.

22. A method according to claim 21 wherein the step of removing the electrostatically charged powder from the sump comprises rotating a paddle wheel, the paddle wheel removing powder material from the sump.

23. A method according to claim 22 wherein the paddle wheel is magnetic.

24. A method according to any one of claims 21 to 23 further comprising the step of monitoring the amount of powder material in the sump.

25. A method according to any one of claims 21 to 24 further comprising the step of replenishing the powder material in the sump.

26. A method according to any one of claims 21 to 25 wherein the step of mixing comprises rotating three substantially parallel elongate mixers, the third mixing shaft being positioned between the first and second mixing shafts and having mixing paddles thereon, the paddles on the three mixing shafts meshing as the mixing shafts rotate.

27. A method according to any one of claims 21 to 26 wherein at least one of the mixing shafts includes slots for increasing the rate of charging of the powder material.

28. A method as claimed in any one of claims 21 to 27, further comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from a sump onto a sleeve of the applicator;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing solid dosage forms alongside the sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

29. A method according to claim 28 further comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from the sump onto a second sleeve of the applicator;

rotating the mixture around the second sleeve by applying a rotating magnetic field to the sleeve;

passing the solid dosage forms alongside the second sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

30. A method according to claim 29 wherein the rotating magnetic field applied to the first sleeve rotates in the opposite direction to the rotating magnetic field applied to the second sleeve.

31. A method according to any one of claims 28 to 30 further comprising the step of returning the magnetized carrier material to the sump.

32. A method according to any one of claims 28 to 31 further comprising the step of controlling the height of the mixture on the sleeve or sleeves.

33. A method according to claim 32 wherein the step of controlling the height of the mixture on the sleeve or sleeves is achieved by a blade alongside the sleeve or sleeves.

34. A method according to any one of claims 28 to 33 further comprising the step of earthing the solid dosage forms before passing them alongside the sleeve or sleeves.

35. A method according to any one of claims 28 to 34 wherein the rotating magnetic field is applied to the sleeve or sleeves by at least one magnet inside the sleeve or sleeves.

36. A method according to any one of claims 28 to 35 wherein the sleeve or sleeves are substantially cylindrical.

37. A method according to any one of claims 28 to 35 wherein the sleeve or sleeves are substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve located on the sleeve where the solid dosage forms are arranged to pass alongside the sleeve or sleeves.

38. A method according to any one of claims 28 to 37 wherein the sleeve or sleeves include a magnetic shield arranged to provide a localised reduction in the magnetic field strength at the surface of the sleeve at an offload position of said sleeve.

39. A method according to claim 38, wherein said shield is a mu-metal shield.

40. A method according to any one of claims 28 to 39 wherein the sleeve or sleeves are made from stainless steel.

41. Apparatus for electrostatically charging powder material, the apparatus comprising a mixer for mixing a sump of the powder material to electrostatically charge the powder material, the mixer comprising three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions, the third mixing shaft being positioned between the first and

second mixing shafts, having mixing paddles thereon and being arranged to rotate in either direction, the paddles on the three mixing shafts being arranged to mesh as the mixing shafts rotate.

42. A method for electrostatically charging powder material, the method comprising mixing a sump of the powder material to electrostatically charge the powder material, the mixing comprising rotating three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles, the third mixing shaft being positioned between the first and second mixing shafts and having mixing paddles thereon, the paddles on the three mixing shafts meshing as the mixing shafts rotate.

43. An applicator for electrostatically applying powder material to solid dosage forms, the applicator comprising:

a sleeve for receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material from a sump, the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve and the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto solid dosage forms passing alongside the sleeve.

44. An applicator according to claim 43 further comprising at least one magnet inside the sleeve for applying the rotating magnetic field to the sleeve.

45. An applicator according to claim 43 or claim 44 further comprising a second sleeve for receiving a mixture of electrostatically charged powder material combined with a

magnetized carrier material from the sump, the second sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the second sleeve and the second sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto the solid dosage forms passing alongside the second sleeve.

46. An applicator according to claim 45 further comprising at least one magnet inside the second sleeve for applying the rotating magnetic field to the second sleeve.

47. An applicator according to claim 45 or claim 46 wherein the first sleeve and the second sleeve are arranged to have oppositely rotating magnetic fields applied thereto.

48. An applicator according to any one of claims 43 to 47 further comprising a blade alongside the sleeve or sleeves for controlling the height of the mixture on the sleeve or sleeves.

49. An applicator according to any one of claims 43 to 48 wherein the sleeve or sleeves are substantially cylindrical.

50. An applicator according to any one of claims 43 to 48 wherein the sleeve or sleeves are substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve located on the sleeve where the solid dosage forms are arranged to pass alongside the sleeve or sleeves.

51. An applicator according to any one of claims 43 to 50, wherein the sleeve or sleeves include a magnetic shield arranged to provide a localised reduction in the magnetic

field strength at the surface of the sleeve at an offload position of said sleeve.

52. An applicator according to claim 51, wherein said shield is a mu-metal shield.

53. An applicator according to any one of claims 43 to 52 wherein the sleeve or sleeves are made from stainless steel.

54. A method for electrostatically applying powder material to solid dosage forms, the method comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from a sump onto a sleeve;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing solid dosage forms alongside the sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

55. A method according to claim 54 further comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from the sump onto a second sleeve;

rotating the mixture around the second sleeve by applying a rotating magnetic field to the sleeve;

passing the solid dosage forms alongside the second sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

56. A method according to claim 55 wherein the rotating magnetic field applied to the first sleeve rotates in the opposite direction to the rotating magnetic field applied to the second sleeve.

57. A method according to any one of claims 54 to 56 further comprising the step of returning the magnetized carrier material to the sump.

58. A method according to any one of claims 54 to 57 further comprising the step of controlling the height of the mixture on the sleeve or sleeves.

59. A method according to claim 58 wherein the step of controlling the height of the mixture on the sleeve or sleeves is achieved by a blade alongside the sleeve or sleeves.

60. A method according to any one of claims 54 to 59 further comprising the step of earthing the solid dosage forms before passing them alongside the sleeve or sleeves.

61. A method according to any one of claims 54 to 60 wherein the rotating magnetic field is applied to the sleeve or sleeves by at least one magnet inside the sleeve or sleeves.

62. A method according to any one of claims 54 to 61 wherein the sleeve or sleeves are substantially cylindrical.

63. A method according to any one of claims 54 to 61 wherein the sleeve or sleeves are substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve located on the sleeve where the

solid dosage forms are arranged to pass alongside the sleeve or sleeves.

64. A method according to any one of claims 54 to 63, wherein the sleeve or sleeves include a magnetic shield arranged to provide a localised reduction in the magnetic field strength at the surface of the sleeve at an offload position of said sleeve.

65. A method according to claim 64 wherein said shield is a mu-metal shield.

66. A method according to any one of claims 54 to 65 wherein the sleeve or sleeves are made from stainless steel.

67. An applicator for electrostatically applying powder material to substrates, the applicator comprising two sleeves for receiving a mixture of electrostatically charged powder material combined with a magnetic carrier material from one sump, the sleeves being arranged to have electric potentials applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeves, the sleeves being arranged to have rotating magnetic fields applied thereto for rotating the mixture around the sleeves, the magnetic fields applied to the two sleeves being arranged to rotate in opposite directions.

68. A method for electrostatically applying powder material to substrates, the method comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from one sump onto two sleeves;

rotating the mixture around the sleeves in opposite directions by applying a rotating magnetic field to each sleeve;

passing substrates alongside the sleeves;

applying an electric potential to each sleeve, thereby driving the electrostatically charged powder material onto the substrates.

69. An applicator for electrostatically applying powder material to substrates, the applicator comprising:

a sleeve for receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material from a sump,

the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve,

the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeve, and

the sleeve being substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve located on the sleeve where the substrates are arranged to pass alongside the sleeve.

70. A method for electrostatically applying powder material to solid dosage forms, the method comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from a sump onto a sleeve, the sleeve being substantially in the shape of a cylinder but having a flattened portion running substantially the length of the sleeve;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing solid dosage forms alongside the flattened portion of the sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

71. An applicator for electrostatically applying powder material to substrates, the applicator comprising:

a sleeve for receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material from a sump,

the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve,

the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeve, and the sleeve including a magnetic shield arranged to provide a localised reduction in the magnetic field strength at the surface of the sleeve at an offload position of said sleeve.

72. A method for electrostatically applying powder material to solid dosage forms, the method comprising the steps of:

receiving a mixture of electrostatically charged powder material combined with a magnetized carrier material, from a sump onto a sleeve, the sleeve including a magnetic shield arranged to provide a localised reduction in the magnetic field strength at the surface of the sleeve at an offload position of said sleeve;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing solid dosage forms alongside the flattened portion of the sleeve;

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

73. Apparatus for electrostatically applying powder material to solid dosage forms, the apparatus comprising apparatus according to any one of claims 1 to 9 and an applicator according to any one of claims 43 to 53.

74. Apparatus for electrostatically applying powder material to solid dosage forms, the apparatus comprising:

a mixer for mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixer comprising two substantially parallel elongate mixing shafts having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions:

a feeder for removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump and supplying it to an applicator;

an applicator comprising a sleeve for receiving the mixture of electrostatically charged powder material and magnetized carrier material, the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve and the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto solid dosage forms passing alongside the sleeve.

75. A method for electrostatically applying powder material to solid dosage forms, the method comprising a method according to any one of claims 21 to 27 and a method according to any one of claims 54 to 66.

76. A method for electrostatically applying powder material to solid dosage forms, the apparatus comprising the steps of:

mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the step of mixing comprising rotating two substantially parallel elongate mixing shafts in opposite directions, the mixing shafts having oppositely angled mixing paddles;

removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump;

supplying the mixture of electrostatically charged powder material and magnetized carrier material to a sleeve;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing solid dosage forms alongside the sleeve; and

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the solid dosage forms.

77. Apparatus for electrostatically applying powder material to substrates, the apparatus comprising:

a mixer for mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixer comprising three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions, the third mixing shaft being positioned between the first and second mixing shafts, having mixing paddles thereon and being arranged to rotate in either direction, the paddles on the three mixing shafts being arranged to mesh as the mixing shafts rotate;

a feeder for removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump and supplying it to an applicator;

an applicator comprising a sleeve for receiving the mixture of electrostatically charged powder material and magnetized carrier material, the sleeve being arranged to have a rotating magnetic field applied thereto for rotating the mixture around the sleeve and the sleeve being arranged to have an electric potential applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeve.

78. A method for electrostatically applying powder material to substrates, the method comprising the steps of:

mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixing comprising rotating three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles, the third mixing shaft being positioned between the first and second mixing shafts and having mixing paddles thereon, the paddles on the three mixing shafts meshing as the mixing shafts rotate;

removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump;

supplying the mixture of electrostatically charged powder material and magnetized carrier material to a sleeve;

rotating the mixture around the sleeve by applying a rotating magnetic field to the sleeve;

passing substrates alongside the sleeve; and

applying an electric potential to the sleeve, thereby driving the electrostatically charged powder material onto the substrates.

79. Apparatus for electrostatically applying powder material to substrates, the apparatus comprising:

a mixer for mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixer comprising two substantially parallel elongate mixing shafts having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions:

a feeder for removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump and supplying it to an applicator;

an applicator comprising two sleeves for receiving a mixture of electrostatically charged powder material combined with a magnetic carrier material, the sleeves being arranged to have electric potentials applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeves, the sleeves being arranged to have rotating magnetic fields applied thereto for rotating the mixture around the sleeves, the magnetic fields applied to the two sleeves being arranged to rotate in opposite directions.

80. A method for electrostatically applying powder material to substrates, the method comprising the steps of:

mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the step of mixing comprising rotating two substantially parallel elongate mixing shafts in opposite directions, the mixing shafts having oppositely angled mixing paddles;

removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump;

supplying the mixture of electrostatically charged powder material and magnetized carrier material to two sleeves;

rotating the mixture around the sleeves in opposite directions by applying a rotating magnetic field to each sleeve;

passing substrates alongside the sleeves;

applying an electric potential to each sleeve, thereby driving the electrostatically charged powder material onto the substrates.

81. Apparatus for electrostatically applying powder material to substrates, the apparatus comprising:

a mixer for mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixer comprising three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles thereon and being arranged to rotate in opposite directions, the third mixing shaft being positioned between the first and second mixing shafts, having mixing paddles thereon and being arranged to rotate in either direction, the paddles on the three mixing shafts being arranged to mesh as the mixing shafts rotate;

a feeder for removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump and supplying it to an applicator;

an applicator comprising two sleeves for receiving a mixture of electrostatically charged powder material combined with a magnetic carrier material, the sleeves being arranged to have electric potentials applied thereto to drive the electrostatically charged powder material onto substrates passing alongside the sleeves, the sleeves being arranged to have rotating magnetic fields applied thereto for rotating

the mixture around the sleeves, the magnetic fields applied to the two sleeves being arranged to rotate in opposite directions.

82. A method for electrostatically applying powder material to substrates, the method comprising the steps of:

mixing a sump of the powder material combined with a magnetized carrier material to electrostatically charge the powder material, the mixing comprising rotating three substantially parallel elongate mixing shafts, the first mixing shaft and the second mixing shaft having oppositely angled mixing paddles, the third mixing shaft being positioned between the first and second mixing shafts and having mixing paddles thereon, the paddles on the three mixing shafts meshing as the mixing shafts rotate;

removing the mixture of electrostatically charged powder material and magnetized carrier material from the sump;

supplying the mixture of electrostatically charged powder material and magnetized carrier material to two sleeves;

rotating the mixture around the sleeves in opposite directions by applying a rotating magnetic field to each sleeve;

passing substrates alongside the sleeves;

applying an electric potential to each sleeve, thereby driving the electrostatically charged powder material onto the substrates.

83. Apparatus according to claims 77, claim 79 or claim 81 further comprising a sump of powder material.

84. Apparatus according to claim 83 wherein the sump of powder material is contained in a replaceable cartridge.

85. A sump of powder material for use with apparatus according to any one of claims 1 to 20, 41, 43 to 53, 67,69,71,73,74,77,79 or 81.

86. A cartridge comprising a sump of powder material according to claim 85.